Remarks:

Reconsideration of the application, as amended herein, is respectfully requested.

Applicants appreciatively acknowledge the Examiner's confirmation of receipt of Applicants' claim for priority and certified priority document under 35 U.S.C. § 119(a)-(d).

Applicants note that the Office Action Summary sheet at the front of the Office Action indicated that the oath/declaration was objected to and directed the Applicants to the Office Action or to form PTO-152. However, the Office Action does not reference the oath/declaration, nor does the Office Action provide any objection thereto. Further, the Office Action did not include a form PTO-152 attached thereto. As such, Applicants respectfully request clarification of the alleged objection to the oath/declaration filed in the instant case, or otherwise request that the reference to said objection be canceled from the Office Action Summary sheet.

Claims 1 - 3 and 5- 15 are presently pending in the application. Claims 1 - 3, 5 - 10 and 14 - 15 are subject to examination and claims 11 - 13 have been withdrawn from examination. Claims 1 have been amended. New claim 15 has been added and is believed to be directed to the elected Group I. Claim 4 has been canceled.

On page 2 of the above-identified Office Action, affirmation of Applicants' election of Group I was requested. Applicants confirm herein that Applicants' elect to proceed with the prosecution of Group I, including claims 1 - 10 and 14, at this time. As previously stated, Applicants have added new claim 15, herein, which is believed to also be directed to the elected group.

On page 3 of the Office Action, claims 1 - 10 and 14 were objected to on the basis of two informalities. First, claim 1, line 9 was objected to for a second recitation of "determining a heat transmission coefficient". The Examiner's suggested correction to claim 1 has been made.

However, Applicants' claim 11 was additionally objected to for including the phrase "fed back", as allegedly being a typographical error representative of the word "feedback". Applicants respectfully disagree. Rather, the phrase "fed back" is a verb clause (i.e., fed being the past tense of "feed", and "back" modifying "fed"), describing the signal which is being "fed back from" (i.e., comes back from) the real process. As such, it is believed that no correction of claim 11 is required at this time.

On page 3 of the Office Action, claims 1, 4, 5, 8 and 10 were rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by U. S. Patent No. 4,916,715 to Adiutori ("**ADIUTORI**"). On page 5 of the Office Action, claim 14 was rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by U. S. Patent No. 3,256,734 to Storke ("**STORKE**").

Additionally on page 5 of the Office Action, claims 2 and 3 were rejected under 35 U.S.C. § 103(a) as allegedly being obvious over **ADIUTORI** in view of U. S. Patent No. 4,593,527 to Nakamoto et al ("**NAKAMOTO**"). On page 6 of the Office Action, claims 6 and 7 were rejected under 35 U.S.C. § 103(a) as allegedly being obvious over **ADIUTORI** in view of Carslaw and Jaegar, Conduction of Heat and Solids, 2nd Edition, ("**CARSLAW**"). Additionally on page 6 of the Office Action, claim 9 was rejected under 35 U.S.C. § 103(a) as allegedly being obvious over **ADIUTORI**. On page 7 of the Office Action, claim 14 was further rejected under 35 U.S.C. § 103(a) as allegedly being obvious over **ADIUTORI** in view of **STORKE**.

Applicants note that page 3 of the Office Action alleged that claim 8 was anticipated by **ADIUTORI**, while page 4 of the Office Action alleged that claim 8 was obvious under 35 U.S.C. § 103(a) over **ADIUTORI**. In the event that the objections to

claim 8 are not overcome by the present Amendment, clarification of the status of claim 8 is respectfully requested.

Additionally, Applicants respectfully traverse the above rejections, as applied to the amended claims.

More particularly, Applicants' claim 1 has been amended to recite, among other limitations:

> A control **method in a thermal system containing an obstruction-curved and thick-walled component** through which a medium flows, [emphasis added by Applicants]

Similarly, Applicants' new claim 15 recites, among other limitations:

> A control method in **a thermal system containing** an **obstruction-curved and thick-walled component** part of a power station, through which a medium flows, [emphasis added by Applicants]

Although in the preamble, this **obstruction-curved and thick-walled component** of claims 1 and 15 are incorporated into the limitations of the body of the claim. For example, claims 1 and 15 recite, among other limitations:

> detecting a temperature difference between the middle wall temperature and the internal wall temperature **of the component**; [emphasis added by Applicants]

As such, Applicants' claims 1 and 15, and all claims depending therefrom, require, among other limitations, **a control method to be performed in a thermal system containing an obstruction-curved and thick-walled component**. Support for this limitation can be found in the specification of the instant application, for example, on page 1 of the instant application, lines 13 - 15, which states:

> The thermal system of interest **has an obstruction-curved and/or thick-walled component** through which a medium flows. [emphasis added by Applicants]

See also, for example, Fig. 1 of the instant application and originally filed claim 4, now canceled.

Additionally, Applicants' claims 1 and 15, and all claims depending therefrom, require, among other limitations, that **the temperature difference be determined using the middle wall temperature and the internal wall temperature of the obstruction-curved and thick-walled component.** This limitation is supported by the specification of the instant application, for example, by Fig. 1, and on page 15 of the instant application, lines 16 - 19, which state:

> As a result, **a temperature difference (T_m-T_i) between the middle wall temperature T_m and the internal wall temperature T_i occurs**, which is required for determining the heat flux density q of the heat flux from the medium into the wall. [emphasis added by Applicants]

Additionally, Applicants' claims 1 and 15 recite, among other limitations:

> determining a respective **heat transmission coefficient between the medium flowing through the component and the wall of the component** from the temperature difference between the middle wall temperature and the internal wall temperature and the heat flux density; [emphasis added by Applicants]

As such, Applicants' claims 1 and 15, and claims depending therefrom, require the determination of a heat transmission coefficient **between the medium and the wall of the obstruction-curved and thick-walled component**. This limitation of Applicants' claims is disclosed in the specification of the instant application, for example, on page 11 of the instant application, lines 18 - 22, which state:

> The heat flux density q, determined by the novel method (2) presented here or by another method according to the prior art, of **the heat flux from the medium into the wall is then used in order to determine the heat transmission coefficient α between the medium and the wall of a component**. [emphasis added by Applicants]

None of the references cited in the Office Action teach or suggest Applicants' invention of claims 1 and 15. More particularly, Applicants' former claim 1 was rejected as being allegedly anticipated by **ADIUTORI**. However, among other limitations of Applicants' claims, the **ADIUTORI** reference fails to teach or suggest, **detecting a temperature difference between the middle wall temperature and the internal wall**

temperature of the component, as required by Applicants' claims 1 and 15.

More particularly, in **ADIUTORI**, the distribution of heat flux and the heat transmission coefficient are detected **on a surface** of the cooled component. See for example, col. 3 of **ADIUTORI**, lines 20 - 24 (i.e., "One example of the invention involves determining the heat flux and heat transfer coefficient distribution **on the surface** of a cooled component by attaching a plurality of temperature measuring devices to **a predetermined surface** of the component, ..."). Clearly, **ADIUTORI** discloses attaching several temperature measurement devices onto **a** (i.e. one) predetermined **surface** of the cooled component. See, for example, col. 3 of **ADIUTORI**, line 24. **ADIUTORI** discloses components that are, for example, turbine blades or components of a gas turbine engine. In contrast to **ADIUTORI**, Applicants' invention, pertains to a method, wherein a hot medium (i.e., preferably steam), and not a cooling liquid, flows through obstruction-curved thick-walled components.

More particularly, **ADIUTORI** discloses using thermal pairs attached **to a surface of the component** (i.e., col. 5 of **ADIUTORI**, lines 17 - 18) to determine a temperature difference from the temperatures detected by the thermal pairs and the

temperature of the coolant. See, for example, col. 5 of **ADIUTORI**, lines 49-53. However, **ADIUTORI** fails to teach or suggest, among other limitations of Applicants' claims, determining the temperature difference between the middle wall temperature and the internal wall temperature of the component, because, in the case of the cooled components of **ADIUTORI**, no relevant temperature deviations exist between any middle wall temperature and internal wall temperature occur, due to the small wall thickness of the components. Note that, in **ADIUTORI**, col. 5, lines 5 - 7 state that the wall of the blade is "**uniform and thin**".

In contrast to the disclosure in **ADIUTORI**, Applicants' invention relates to claims a control method for a thermal system of an obstruction-curved, thick-walled component. Such a component exhibits a different thermal behavior than a thin-walled component, when the temperature of the medium flowing through the component is changed. Rather, in order to describe the typical behavior of an obstruction-curved, thick-walled component, as claimed by Applicants, at least **two** temperature measurements (i.e., medium wall temperature and internal wall temperature) are required to be measured at different locations within the wall of the component.

Applicants note that page 4 of the Office Action alleged that the term "thick walled", as used in Applicants' former claim 4, was "a relative term and the specification provides on specific metes and bounds for the scope of the claim language". Applicants respectfully disagree. More particularly, Applicants point to Fig. 1 of the present application from which the characteristic "thick-walled" can be acquired and which clearly shows a difference relative to the "uniform and thin" turbine blade illustrated in Figs. 1, 2 and 4 of **ADIUTORI**. In fact, the term "thick-walled", as used in the instant application, is a term of art in this field, and its meaning would be understood by the person of ordinary skill in the field of power plants. This can be seen from even the title of the reference to L. Speitkamp, "Determination Of Temperature Differences In Thick-Walled Pressure Vessels From The Temporal Sequence Of Temperature Measurement Values At The Isolated Outer Side Of The Wall", VGB Power Plant Engineering 68 (1988), No. 2, pages 182-186, cited on page 4 of the instant application, lines 6-13. As such, Applicants' believe that a person of skill in this art would understand the "metes and bounds" of the term "thick-walled", as used in the present claims. Additionally, a person of skill in this art would understand the term "thick-walled", as used in the instant application, to be incapable

of encompassing the clearly disclosed "**thin**" turbine blade walls of the **ADIUTORI** reference.

Even though the method according to **ADIUTORI** describes the determination of two temperatures for detecting a temperature difference, in **ADIUTORI, both temperature measurements are performed at the same surface of the component.**

Col. 6 of **ADIUTORI**, lines 44 - 50 (cited in the Office Action), states:

> In addition to thermocouples 25-28, 30, and 31, a temperature measuring device not shown in FIG. 4 is provided to measure the temperature of cooling fluid passing through the hollow interior 23 of the blade. This temperature measuring device may be another thermocouple situated so that it is exposed to the cooling fluid as it enters or leaves the blade.

However, the above-quoted portion of **ADIUTORI** (cited in the Office Action) **only** describes the determination of the temperature of the cooling fluid. However, in the case of thick-walled components (as claimed by Applicants), the temperature of the medium flowing through the component **cannot** be equated with the temperature of the wall of the component. As such, the heat transmission coefficient of **ADIUTORI** is **not** determined in the manner required by Applicants' claims 1 and 15, and thus, is not analogous to the heat transmission

coefficient of those claims. As such, Applicants' claims 1 and 15 are believed to be patentable over **ADIUTORI**.

Additionally, Applicants' invention of claims 1 and 15 recite, among other limitations, **using the heat transmission coefficient to influence properties of the medium**. More particularly, Applicants' claim 1 recites, among other limitations:

> using the heat transmission coefficient to influence properties of the medium, and thereby taking into account heat stresses in the component.

Applicants' new claim 15 recites, among other limitations:

> using the heat transmission coefficient to influence properties of the medium in a controlled manner according to an efficiency criterion and to maintain permissible heat stresses

This feature of Applicants' claims 1 and 15 permits the load changes to be performed as economically and cost efficiently as possible, with a short start-up and shut down period, as well as, with a high degree of effectiveness, by obtaining a high efficiency of a load change through the maximum utilization of the permissible heat stresses on the component through which the medium flows.

However, contrary to the invention of claims 1 and 15, **ADIUTORI** discloses providing the heat transmission coefficient

in order to determine the heat flux calibration data for the temperature measurement devices from the power of the heating device, the coolant temperature and the output signals of the temperature measurement device by means of a method disclosed in **ADIUTORI**. **ADIUTORI** fails to teach or suggest using **the determined heat transmission coefficients to specifically influence the properties of the medium**, as required by Applicants' claims 1 and 15.

For the foregoing reasons, among others, Applicants' claims 1 and 15 are neither taught, nor suggested, by the **ADIUTORI** reference.

Further, Applicants' new claim 15 recites, among other limitations:

> adapting the heat transmission coefficient changing with the varying medium properties **to a profile of a load change in the power station.** [emphasis added by Applicants]

As such, Applicants' claim 15 requires, among other things, that the heat transmission coefficient be adapted, as the properties of the medium change, to a profile of the load change of the power station. Applicants respectfully disagree with the comments on page 4 of the Office Action (i.e., with regard to claim 8) **that the load change for a turbine component discloses adapting the heat transmission**

coefficient, which changes with the varying medium properties, to a profile of a load change in the power station, as required by Applicants' claim 15. Applicants' believe that the cited prior art references neither teach, nor suggest, the above-limitation of Applicants' claim 15, i.e., wherein a heat transmission coefficient that changes with the varying properties of the medium used in the power station, is adapted to a profile of a load change in the power station.

For the foregoing reasons, among others, Applicants' claim 15 is believed to be patentable over the **ADIUTORI** reference.

The **NAKAMOTO**, **CARSLAW** and **STORKE** references, cited in the Office Action in combination with **ADIUTORI** against certain of Applicants' dependent claims, do not cure the above-discussed deficiencies of the **ADIUTORI** reference. As such, Applicants' claims are believed to be patentable over **ADIUTORI**, **NAKAMOTO**, **CARSLAW** and **STORKE**, whether taken alone or in combination.

Further, Applicants' claim 14 was rejected on page 5 of the Office Action as allegedly being anticipated by **STORKE**. Applicants respectfully traverse the rejection. Applicants respectfully disagree that claim 14 was a product by process claim, or that a device "configured to" carry out a certain method is a product by process limitation. A "product by

process" claim is one in which **a product is made by a certain process**. See, for example, MPEP § 2113, which states, in part:

> The structure implied by the process steps should be considered when assessing the patentability of product-by-process claims over the prior art, **especially where the product can only be defined by the process steps by which the product is made**, or **where the manufacturing process steps** would be expected to impart distinctive structural characteristics to the final product. [emphasis added by Applicants]

Similarly, section 8.05 of Chisum, Chisum on Patents, Rel.37-2/91, Pub.525, page 8-81, defines a "product by process" claim, as follows:

> A "product-by-process" claim is one in which the product is defined at least in part in terms of **the method or process by which it is made**. [emphasis added by Applicants]

Claim 14 of the instant application does **not** recite a device (i.e., a **product**) **made by** a particular **method** or **process**. Rather, Applicants' claim 14 recites a device that **is configured to carry out a particular method.** Such a device (i.e., one configured to **perform** a process) is **not** a device that is **made by** a particular process. This can particularly be seen by asking the question "**what product is made/manufactured by the process of the claim?**". In asking this question, the device of claim 14 is not a **product by** (i.e., resulting from) the **process** of claim 1. Thus,

Applicants' claim 14 is not a "product by process" claim and does not include a "product by process" limitation, as alleged on page 5 of the Office Action.

As such, Applicants' claim 14, as presently put forward, **must be interpreted to recite interconnected control and closed-loop control modules configured to perform each step** of the method of claim 1, **and each such module** (i.e., corresponding to each method step of claim 1) **must be given patentable weight.** Among other limitations of Applicants' claim 14, the **STORKE** reference fails to teach or suggest, **a control module configured to determine a temperature difference using the middle wall temperature and the internal wall temperature of the obstruction-curved and thick-walled component,** as required by Applicants' claim 14. For the above reasons, among others, Applicants' claim 14 is believed to be patentable over the **STORKE** reference.

It is accordingly believed that none of the references, whether taken alone or in any combination, teach or suggest the features of claims 1 and 15. Claims 1 and 15 are, therefore, believed to be patentable over the art. The dependent claims are believed to be patentable as well because they all are ultimately dependent on claim 1.

In view of the foregoing, reconsideration and allowance of claims 1 - 15 are solicited.

In the event the Examiner should still find any of the claims to be unpatentable, counsel would appreciate receiving a telephone call so that, if possible, patentable language can be worked out.

If an extension of time for this paper is required, petition for extension is herewith made.

Please charge any fees that might be due with respect to Sections 1.16 and 1.17 to the Deposit Account of Lerner Greenberg Stemer LLP, No. 12-1099.

Respectfully submitted,

For Applicants

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